Montana Hoover

Location: Annapolis, MD 21409

Email: mjhoover@umd.edu

Phone: (443) 852-8655

Phone: (443) 852-8655

GitHub: github.com/mjhoover1

LinkedIn: linkedin.com/in/montana-hoover-9809b8118

Personal Academic Site:
https://mjhoover1.github.io/mjhoover.github.io/

SUMMARY

Ph.D. candidate in Computer Science at the University of Maryland researching 3D vision, point cloud understanding, and generative AI. Contributor to state-of-the-art place recognition systems and visualization tools. Experienced in deep learning, point cloud processing, and cross-source data fusion. Former NASA intern with a strong background in scientific programming and AI applications.

OBJECTIVE

To obtain a research, internship, or full-time position in computer science focused on programming, data science, and artificial intelligence where I can contribute to impactful projects and advance my academic and professional skills.

EDUCATION

University of Maryland, College Park, MD

Ph.D. in Computer Science, Artificial Intelligence Focus (Aug 2022 – May 2026), GPA: 3.9
M.S. in Computer Science, Artificial Intelligence Focus (2021 – 2022), GPA: 3.9
B.S. in Computer Science, Data Science Specialization (2018 – 2021), B.S. in Mathematics, Statistics Specialization (2018 – 2021), GPA: 3.86

Anne Arundel Community College, Arnold, MD

A.S. in Computer Science (2015 – 2018), Certificate in Scientific Programming, GPA: 3.9

RESEARCH INTERESTS

- 3D Computer Vision
- LiDAR and Point Clouds
- Generative Models (Diffusion Models, Autoencoders)
- Robotics
- Deep Learning and Representation Learning

RESEARCH EXPERIENCE

Artificial Intelligence Researcher, Applied Research Laboratory for Intelligence and Security (ARLIS), UMD (*Jul 2022 – Present*)
- Designing and developing 3D spatial software tools for digital twin applications in defense and intelligence
- Previously applied reinforcement learning to optimize supply chain simulations using AnyLogic

---

Graduate Researcher, University of Maryland, College Park (*2021 – Present*)
- Contributor to CROSSLOC3D (ICCV 2023), a cross-source 3D place recognition framework
- Research focus on generative modeling with latent diffusion and autoencoder architectures
- Lead contributor to Sand Browser and Spatial Data Structure Visualizations (Spatial Index Demos: https://donar.umiacs.umd.edu/quadtree/)
- Contributor to research on adversarial attacks against MAML in few-shot learning contexts
- Contributed to research on differentiable agent-based traffic simulation using JAX to accelerate simulation runtime

PUBLICATIONS

T. Guan, A. Muthuselvam, M. Hoover, et al.
CROSSLOC3D: Aerial-Ground Cross-Source 3D Place Recognition. In Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), 2023.
Paper: https://openaccess.thecvf.com/content/ICCV2023/papers/Guan_CrossLoc3D_Aerial-Ground_Cross-Source_3D_Place_Recognition_ICCV_2023_paper.pdf

Code: rayguan97/crossloc3d: CrossLoc3D: Aerial-Ground Cross-Source 3D Place Recognition -- ICCV 2023

TECHNICAL SKILLS

- **Languages**: Python, C++, C, Java, SQL, R, Swift, HTML/CSS, MATLAB
- **Libraries & Frameworks**: PyTorch, TensorFlow, Keras, OpenSSL, NumPy, Spark, Django
- **Tools**: Git, GitHub, Jupyter, PostgreSQL, Linux/Unix, Docker

SELECTED PROJECTS

- **CROSSLOC3D**: Aerial-ground 3D place recognition with diffusion-based feature refinement (ICCV 2023)
- **Adversarial Attacks on MAML**: Transferable patch attacks and watermark poisoning in few-shot settings
- **Differentiable Traffic Simulation**: Integrated JAX into differentiable traffic simulator to enable GPU acceleration and gradient-based optimization
- **Stock Market COVID Analysis**: Data scraping, transformation, linear regression, and ML in R

- **Secure ATM System in C**: MITM-resistant system using OpenSSL and security modeling
- **Autonomous Shopping Cart Planning**: Comparing HTN (PyHOP) vs A* planning on simulated tasks
- **Advanced SQL + Web Interfaces**: PostgreSQL queries, JSON processing, Flask/Django development

PROFESSIONAL EXPERIENCE

Mass Spectrometer Calibration Intern, NASA Goddard Space Flight Center, Greenbelt, MD (*Mar 2021 – Jun 2021*)

- Developed C++ code for data acquisition and calibration
- Worked with DAQs, Raspberry Pi, and ADCs for sensor alignment and signal processing
- Supported instrument software for ion spectrometry and real-time telemetry

HONORS & AFFILIATIONS

- Mortar Board Senior Honor Society (Adele H. Stamp Chapter)
- Phi Theta Kappa Honor Society (Omicron Theta Chapter)
- Dean's List (All semesters since 2018)